Brunsing Associates, Inc.

February 15, 2005 Project No. 771

Mr. Gary Holtz
Sonoma County Department of Health Services
Division of Environmental Health
475 Aviation Boulevard, Suite 220
Santa Rosa, California 95403

Soil and Groundwater Investigation and Sensitive Receptor Survey
Cotati Station
8348 Santero Way
Cotati, California

Dear Mr. Holtz:

This letter presents the results a soil and groundwater investigation carried out by Brunsing Associates, Inc. (BAI) for the owners of the property located at 8348 Santero Way, Cotati, California (Plate 1). This site previously had the street address 8348 Industrial Way, Cotati, California and was previously referred to as 100 Santero Way during the initial portion of the underground storage tank (UST) removal. It is our understanding that the presence of the UST was previously unknown by the last two owners of the study site (early 1960s to 2001) and was discovered on October 13, 2003 during grading activities taking place at the study site.

Prior to removal of the UST, BAI submitted the document "Workplan for Underground Storage Tank Removal", dated October 16, 2003 and obtained a County of Sonoma Department of Emergency Services (SCDES) Underground Storage Tank Closure Application permit. After removal of the UST, BAI submitted the document "Underground Storage Tank Removal and Contaminated Soil Excavation", dated February 5, 2004 to the Sonoma County Department of Health Services (SCDHS) for review. The location of the study site is shown on Plate 1. The location of the UST and the excavation soil sampling locations are shown on Plate 2.

BAI submitted the document "Workplan for a Soil and Groundwater Investigation" dated July 7, 2004, outlining tasks to perform a soil and groundwater investigation at the study site. The workplan received approval, with comments, as outlined in the SCDHS letter dated August 31, 2004. The results of the investigation proposed in the workplan are presented herein.

BACKGROUND

UST Removal

The UST contained a sand and water mixture, which was most likely an attempt to abandon the tank in place. The sand and water inside the UST was removed on October 26 and 27, 2003 and placed in 55-gallon, DOT-H drums by Northwest General

Engineering, LLC. (Northwest). Approximately 300-gallons of the sand/water mixture was removed by Northwest. After removal of the product by Northwest, the UST was cleaned by methods of a high-pressure water washing. The wash water was removed and stored in 55-gallon drums.

The UST removal inspection was performed by Captain Andrew Parsons of the SCDES on October 30, 2003, after the UST had been rendered non-explosive with dry-ice. After the inspection, the UST was placed on an appropriate vehicle and transported by Universal Engineering, Inc. (Universal) for proper disposal.

BAI collected two soil samples (Ex-1 and Ex-2) from the native material beneath the UST. Sample Ex-1 was collected from beneath the east end of the UST at 8.0 feet bgs and did not contain any of the analytes. Sample Ex-2 was collected from beneath the west end of the UST at 9.0 feet bgs and contained TPH as gasoline at 210 milligrams per kilogram (mg/kg). A summary of the soil sample analytical results is presented in Table 1. The locations of the soil samples are shown on Plate 2.

Contaminated Soil Excavation

Based on the presence of petroleum product odor in the UST excavation backfill material and the analytical results of sample Ex-2, BAI personnel proposed to Captain Parsons that an attempt be made to excavate the obviously impacted soil for off-site disposal. Impacted soil was excavated based on the presence of obvious contamination (grey-green stained soil), hand-held photoionization detector (PID) measurements, and soil sample analysis. The excavated soil was stockpiled on plastic sheeting. When the results of the PID readings indicated nondetectable or low concentrations in the soil, confirmation soil samples were collected and analyzed. The soil sample locations and the final limits of the excavation are shown on Plate 2.

The excavation was backfilled by Northwest during the period of November 14 through November 16, 2003. The excavation was backfilled with engineered fill from the excavation bottom to the surface grade. A total of 4 sidewall (Ex-4, Ex-5, Ex-6, and Ex-7) and 1 bottom (Ex-3) soil samples were collected and submitted for analytical testing. The samples were analyzed by McCampbell Analytical, Inc. (MAI) for TPH as gasoline, BTEX, and EPA Test Method 8260 compounds, including petroleum oxygenates.

The analytical results indicated nondetectable concentrations of TPH as gasoline, BTEX, and petroleum oxygenates and lead scavengers in confirmation samples Ex-3, Ex-4, Ex-5, and Ex-7. The analytical results indicate that soil contamination was removed to the north (sample Ex-7), to the south (sample Ex-5), to the west (sample Ex-4), and the bottom (sample Ex-3). The soil sample collected from the east sidewall (sample Ex-6) contained nondetectable concentrations of TPH as gasoline, BTEX, and all petroleum oxygenates and lead scavengers, with the exception of MTBE. Sample Ex-6 contained a concentration of MTBE at 6.1 µg/kg.

The stockpiled soil was accepted at Redwood Landfill, Novato, a California Class III landfill. Based on the landfills documents, 234 cubic yards of soil was disposed at Redwood Landfill.

SOIL AND GROUNDWATER INVESTIGATION

Drilling and Soil Sampling

BAI supervised the advancement of the four soil borings (B-1 through B-4) on November 22, 2004, by Clear Heart Drilling, LLC. The locations of the soil borings are shown on Plate 3. The borings were advanced using 6-inch outer diameter, hollow-stem augers. Soil samples were collected by driving a split-spoon sampler into undisturbed soils through the hollow-stem augers. The split-spoon sampler was cleaned between sample drives and was lined with clean, decontaminated, 2.0-inch diameter brass tubes. Upon retrieval of the sampler, the brass tubes were removed and examined for physical characteristics. An appropriate description of the soil sample using the Unified Soil Classification System was entered onto the boring log. After physical characteristics were noted, the ends of the tubes were covered with Teflon sheets and secured by plastic caps. The brass tubes were labeled using a waterproof marker to designate the location, date, name of person doing the sampling, depth at which the sample was taken, and sample ID. All samples retained for analytical testing were logged onto a chain-of-custody record and placed in a cooled ice chest. The soil samples were submitted to BACE Analytical and Field Services (BAFS) within twenty-four hours of collection.

Groundwater Sampling

Borings B-1 and B-2 were each drilled to a total depth of 20 feet bgs. Borings B-3 and B-4 were each drilled to total depths of 15 and 25 feet bgs, respectively. After reaching the total depth in all four borings, a temporary 2-inch diameter well with 0.020-inch slotted casing was installed in each boring. Approximately 1-gallon of groundwater was purged from borings B-1, B-3, and B-4 prior to collection of the groundwater samples. Approximately 1/2-gallon of groundwater was purged from boring B-2 prior to collection of the groundwater sample. The groundwater samples collected from borings B-1 through B-4 were collected using clean, disposable bailers and were transferred to laboratory-supplied containers. The samples were transported to BAFS, under a chain-of-custody record. The collection, documentation, and transporting of the samples were carried out in accordance with the methods stipulated in BAI's July 7, 2004 workplan.

All soil borings were abandoned by removing the casings, filling the borings from total depth to approximately 1-foot bgs with hydrated bentonite chips, and from 1-foot bgs to ground surface with clean native material.

Subsurface Conditions Encountered

Boring B-1 was drilled within the backfill of the excavation. The subsurface conditions encountered in boring B-1 was a clay from the ground surface to approximately 9 feet bgs. A clay that was used to backfill the former UST excavation was encountered from approximately 9 feet to 15 feet bgs. The sandy clay was underlain by a sandy gravel from approximately 15 feet bgs to 20 feet bgs. Silty gravel was encountered from approximately 20 feet to 23 feet bgs. Boring B-1 was drilled to 20.0 feet bgs and two subsequent sample drives were performed for a total depth of 23 feet bgs. Groundwater was initially encountered in boring B-1 at approximately 20 feet bgs.

The subsurface conditions encountered in boring B-2 was a silty clay from ground surface to approximately 10 feet bgs. A clay was encountered from approximately 10 feet to approximately 15 feet bgs. A sandy gravel with clay and silt was encountered from approximately 15 feet to approximately 19 feet bgs. A silty clay was encountered from approximately 19 feet to approximately 21.5 feet bgs. Boring B-2 was drilled to 20 feet bgs and one subsequent sample drive was performed for a total depth of 21.5 feet bgs. Groundwater was encountered in the boring at approximately 19 feet bgs.

The subsurface conditions encountered in boring B-3 was a silty clay from ground surface to approximately 10 feet bgs. A gravelly silty sand was encountered from approximately 10 feet to approximately 15 feet bgs. A sandy gravel with clay and silt was encountered from approximately 15 feet to approximately 16.5 feet bgs. Boring B-3 was drilled to 15 feet bgs and one subsequent sample drive was performed for a total depth of 16.5 feet bgs. Groundwater was encountered in the boring at approximately 15 feet bgs.

A clay with silt was encountered at boring B-4 the entire length of the boring. Boring B-4 was drilled to 25 feet bgs and one subsequent sample drive was performed for a total depth of 26.5 feet bgs. Groundwater was encountered in the boring at approximately 19 feet bgs.

Logs of borings B-1 through B-4 are enclosed as Plate 4 through Plate 7, respectively. The Unified Soil Classification System is presented on Plate 8.

Soil Analytical Results

One to four soil samples from each boring were submitted for analytical testing. Soil samples from all four borings at 16 feet bgs representing the approximate soil/groundwater interface were submitted for analytical testing. Soil samples collected at depths of 11 and 21 feet bgs were also submitted for analyses to evaluate the possible horizontal extent of the soil contamination (Table 1). The soil sample collected from boring B-4 at 26 feet bgs was submitted to verify possible vertical extent of the MTBE contamination reported in the exaction sample Ex-6 at 21 feet bgs.

All soil samples were analyzed for TPH as gasoline, BTEX, and petroleum oxygenates and lead scavengers. None of the analytes were reported in the samples submitted from all four borings. A summary of the soil sample analytical results is presented in Table 1. Copies of the analytical laboratory report is attached as Appendix A.

Groundwater Analytical Results

A groundwater sample was collected from each boring and submitted for analyses of TPH as gasoline, BTEX, petroleum oxygenates, and lead scavengers. The analytical results of the groundwater samples collected from all four borings reported nondetectable concentrations of TPH as gasoline, BTEX, and petroleum oxygenates and lead scavengers. A summary of the groundwater analytical results is presented in Table 2. A copy of the BAFS analytical laboratory report is attached as Appendix A.

SENSITIVE RECEPTOR SURVEY

A Sensitive Receptor Survey (SRS) was performed in January and February 2005 for the Cotati Station 8348 Santero Way site by BAI. The SRS included identification of potential groundwater plume receptors (wells and surface water bodies) within a 1,000-foot radius. Please note that while the study site and adjacent parcels to the north and south are in the City of Cotati limits, the remainder of the property in the 1,000-foot radius study area is within the City of Rohnert Park limits. An inquiry was also made to the City of Rohnert Park Engineering Department (RPED) and the City of Cotati Engineering Department (CED) for determination of both utility depths and municipal wells within ½-mile radius of the site. The identification of domestic wells within 1,000 feet of the site was conducted by a door-to-door survey of property residents and/or owners, and a search of the Sonoma County Permits and Resources Management Department (SCPRMD) well files. A well drillers log search was performed on the State of California Department of Water Resources (DWR) files for well logs within the study area.

Identification of Domestic and Irrigation Wells at the Study Site

There is an abandoned-in-place water well at the study site located approximately 15 feet southeast of the limits of the former UST excavation. The well has an eight-inch diameter, steel casing with a concrete block protecting the well head. The well appears to be abandoned in place based on the presence of gravel at approximately 10 feet below the top of the casing. The well was sounded during the November 22, 2004 drilling and there was no water present. The location of the abandoned in place well is shown on Plate 3.

The results of the well logs from DWR files indicate three, 8-inch diameter wells that were drilled in September 1948 and May 1951 on what appears to be the study site. There is no exact location information presented on the well logs. Information presented on the well logs indicates the wells are 51, 60, and 81 feet in depth and that the first occurrence of water was at 16 feet below the surface grade. The approximate location of these wells are designated as Wells A, B, and C on Plate 9.

Identification of Domestic and Irrigation Wells

A search for water well drillers reports for wells within an approximate 1,000-foot radius of the study site was conducted at both the SCPRMD and the DWR. There were seven wells noted in the SCPRMD and DWR files within 1,000 feet of the study site. The approximate location of these wells are designated as Wells A through G on Plate 9.

Municipal Wells

BAI contacted both the RPED and CED to request locations of municipal wells within a ½-mile radius of the study area. The City of Rohnert Park has two municipal wells and the City of Cotati has one municipal well within one half mile of the study site. The municipal wells that belong to the RPED are designated as wells H and I on Plate 9. The municipal well that belongs to the CED is designated as well J on Plate 9.

Surface Water Bodies

There were no surface water bodies found within 1,000 feet of the study site. Within the radius of interest, the stormwater runoff is controlled by the stormdrains along the paved streets.

Underground Utility Trenches

Permeable backfill used in underground utility trenches can sometimes act as preferential pathways for migration of contaminates. BAI requested locations of public utilities, within a 1,000-foot radius of the study site, from both the RPED and CED. The provided maps of utilities, which include sewer, water, and storm drain lines were made available for review at the both the RPED and CED offices. The area in the vicinity of the study site is residential and industrial; therefore underground telephone, power, and cable lines are most likely within the 1,000-foot radius.

BAI checked the utilities maps for the depths of the sewer lines, storm drain lines and water supply lines. The sewer lines were buried the deepest of all the utility lines in the vicinity of the study site. For the sewer line, the data presented on the documents "County Manor Unit Number 1, Improvement Plans, Sheet 3", by MacKay and Sons, dated February 1972, "Cotati Station Phase 2, Sheet C4, Utility Plan", by Carlenzoli and Associates, Inc., dated July 2004, and "Improvement Plans for Carrage Court Unit 2, Melody Drive Station 6 + 81 to Station 13 + 78", by M. Hudis Consulting Civil Engineer, dated July 1988, indicates that the sewer line in the southern portion of the study area is approximately 9 feet below the street elevation and is approximately 10 feet below the street elevation on the northern portion of the study area, with a slope of 0.3% to the north. The sewer line is shown to be 6 inches in diameter.

Therefore, it appears that the bottom of the sewer trench is likely approximately 9 to 10 feet below the road surface. For the storm drain, the distance between the rim and invert for the closest manhole is not provided on the map. At the study site location, the drain flow direction is to the north. It is BAI's understanding that, in general, storm drain lines are at a depth of approximately 3 feet bgs, and from the maps, the drain line is a 30-inch diameter pipe, therefore, the bottom of the storm drain trench would likely be approximately 6 feet bgs.

CONCLUSIONS

Soil Conditions

The analytical results of the soil sample collected from beneath the former UST indicated there had been a release of product from the former tank (Ex-2; Table 1). Approximately 234 cubic yards of impacted soil was excavated and disposed of off-site. The analytical results of the excavation confirmation soil samples suggests that the vertical extent of the soil contamination is less than approximately 21.5 feet bgs (Ex-3; Table 1) and that no contamination remained to the north, south, and west of the former UST (Table 1). The analytical results of the soil sample collected from the eastern sidewall of the excavation indicate that there was a concentration of MTBE of 6.1 µg/kg (Sample Ex-6) at 21 feet bgs.

The analytical results of all the soil samples collected from borings B-1 through B-4 at depths ranging from 11 feet bgs to 26 feet bgs reported nondetectable concentrations of all analytes. The soil samples analyzed from boring B-4 were intended to define the vertical and horizontal extent of the soil contamination that was reported in sample Ex-6 at 21 feet bgs. The final limits of the excavation and the soil sample locations are shown on Plate 2 and Plate 3.

Groundwater Conditions

Groundwater was encountered in borings B-1, B-2, and B-4 at approximately 18 to 20 feet bgs and in boring B-3 at 15 feet bgs. Grab groundwater samples were collected from each boring in an attempt to evaluate groundwater quality at the former UST excavation area.

The analytical results of the groundwater samples collected from all four borings indicate that there has not been an impact to the groundwater from the presence of the former UST.

Sensitive Receptor Survey

While there are apartment buildings located to the west of the former UST, there are no basements for any potential vapors to collect in. The underground utilities identified during the SRS are not in the vicinity of the former excavation, therefore should not provide conduits for contaminated vapors or water. There are 10 documented domestic water supply wells and municipal wells within the SRS study area. The private residences and businesses within the SRS study area have water supplied by both the City of Rohnert Park and the City of Cotati.

Based on the nondetectable concentrations of TPH as gasoline, BTEX, and petroleum oxygenates and lead scavengers reported in both the soil and groundwater samples collected from all four borings, BAI recommends that this site be reviewed for no further action. It is our understanding that the current site owners will remove the abandoned-in-place water well on the eastern side of the former UST excavation prior to the site grading activities in that area.

If you should have any questions regarding this report, please do not hesitate to contact Bill Coset or Diana Dickerson at (707) 838-3027.

Respectfully submitted,

William H. H. Coset
Project Geologist

Diana M. Dickerson, R.G.
Principal Geologist

WHHC/DMD/wc

Cc: Mr. Luis Rivera
Mr. Larry Colvin

Attachments

Tables

Table 1. Analytical Results of Soil Samples
Table 2. Analytical Results of Grab Groundwater Samples

Plates

Plate 1. Vicinity Map
Plate 2. Excavation Soil Sample Location Map
Plate 3. Soil Boring Location Map
Plate 4. Log of Boring B-1
Plate 5. Log of Boring B-2
Plate 6. Log of Boring B-3
Plate 7. Log of Boring B-4
Plate 8. Unified Soil Classification Chart
Plate 9. Domestic and Municipal Wells Location Map

Appendix

Appendix A. Analytical Laboratory Report

TABLES

Table 1. Analytical Results of Soil Samples

Cotati Station
8348 Santero Way
Cotati, California

Sample/ Boring Number	Sample Loacation	Sample Depth (in feet bgs)	TPH as gasoline (mg/kg)	TPH as diesel (mg/kg)	TPH as motor oil (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl-benzene (µg/kg)	Xylenes (µg/kg)	Petroleum Oxygenates (µg/kg)
UST Removal and Excavation Verification Samples										
Ex-1	beneath UST, east end	8.0	<1.0	<1.0	<10	<5.0	<5.0	<5.0	<5.0	<10 (A)
Ex-2	beneath UST, west end	9.0	**210**	<2.0	<20	<500	<500	<500	<500	<1,000 (A)
Ex-3	bottom	21.5	<1.0	na	na	<4.8	<4.8	<4.8	<4.8	<4.8 - <24
Ex-4	west sidewall	21.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 - <25
Ex-5	south sidewall	21.0	<1.0	na	na	<5.3	<5.3	<5.3	<5.3	<5.3 - <27
Ex-6	east sidewall	21.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	**6.1** (B)
Ex-7	north sidewall	21.0	<0.77	na	na	<4.9	<4.9	<4.9	<4.9	<4.9 - <25
Stockpile (C)	4-point composite	na	**1.3** (D)	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 - <25
Soil Boring Samples										
B-1	within excavation limits	16.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-2	southeast of excav. limits	11.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-2	southeast of excav. limits	16.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-2	southeast of excav. limits	21.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-3	northwest of excav. limits	11.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-3	northwest of excav. limits	16.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-4	northeast of excav. limits	11.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-4	northeast of excav. limits	16.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-4	northeast of excav. limits	21.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50
B-4	northeast of excav. limits	26.0	<1.0	na	na	<5.0	<5.0	<5.0	<5.0	<5.0 to <50

Table 1. Analytical Results of Soil Samples

Cotati Station
8348 Santero Way
Cotati, California
(continued)

Notes:

Petroleum Oxygenates = Petroleum Oxygentates and Lead Scavengers using EPA Test Method 8260, unless otherwise noted. Samples Ex-1 through Ex-7 and stockpile sample analyzed for EPA Test Method 8260 compounds.

< = less than symbol indicates not detected at specified reporting limit.

TPH = total petroleum hydrocarbons.

mg/kg = milligrams per kilogram.

µg/kg = micrograms per kilogram.

na = not analyzed.

Sample depths are measured in feet below ground surface (bgs).

Samples Ex-1 and Ex-2 were collected on October 30, 2003. Samples Ex-3 through Ex- 7 and the stockpile sample were collected on November 3, 2003.

Samples from borings B-1 through B-4 were collected on November 22, 2004.

(A) = Analyzed only for methyl tertiary butyl ether (MTBE) by EPA Test Method 8021B.

(B) = MTBE reported at 6.1 µg/kg. All other compounds indicated below the laboratory reporting limits of 5.0 to 25 µg/kg.

(C) = Also analyzed for total lead, 7.2 mg/kg reported in sample.

(D) = Laboratory report footnoted to state strongly aged gasoline or diesel range compounds are significant.

Table 2. Analytical Results of Grab Groundwater Samples

Cotati Station
8348 Santero Way
Cotati, California

Boring Number	TPH as gasoline (mg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	Petroleum Oxygenates (µg/l)
B-1	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5 to <10
B-2	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5 to <10
B-3	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5 to <10
B-4	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5 to <10

Notes:

< = less than symbol indicates not detected at specified reporting limit.

TPH = total petroleum hydrocarbons.

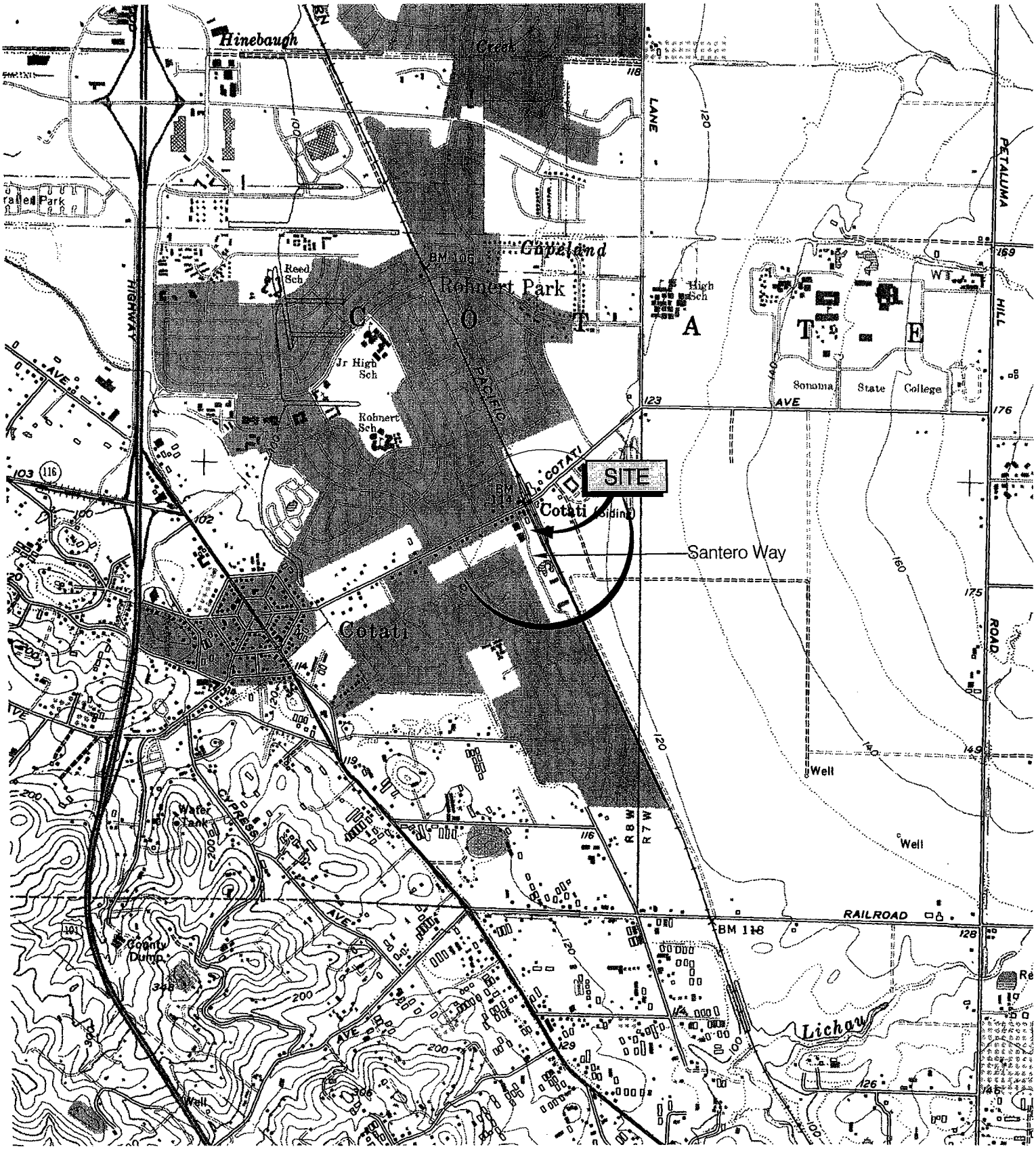
mg/l = milligrams per liter.

µg/l = micrograms per liter.

Groundwater samples were collected on November 22, 2004.

Petroleum Oxygenates - Petroleum oxygenates and lead scavengers, including methyl teriary butyl ether (MTBE) by EPA Test Method 8260.

PLATES



Reference:
USGS 7.5 Min. Quadrangle, Coatati, 1980

NORTH

APPROXIMATE SCALE (FEET)

0 1000 2000 4000

Brunsing Associates, Inc.
5803 Skylane Blvd., Suite A
Windsor, California 95492
Tel: (707) 838-3027

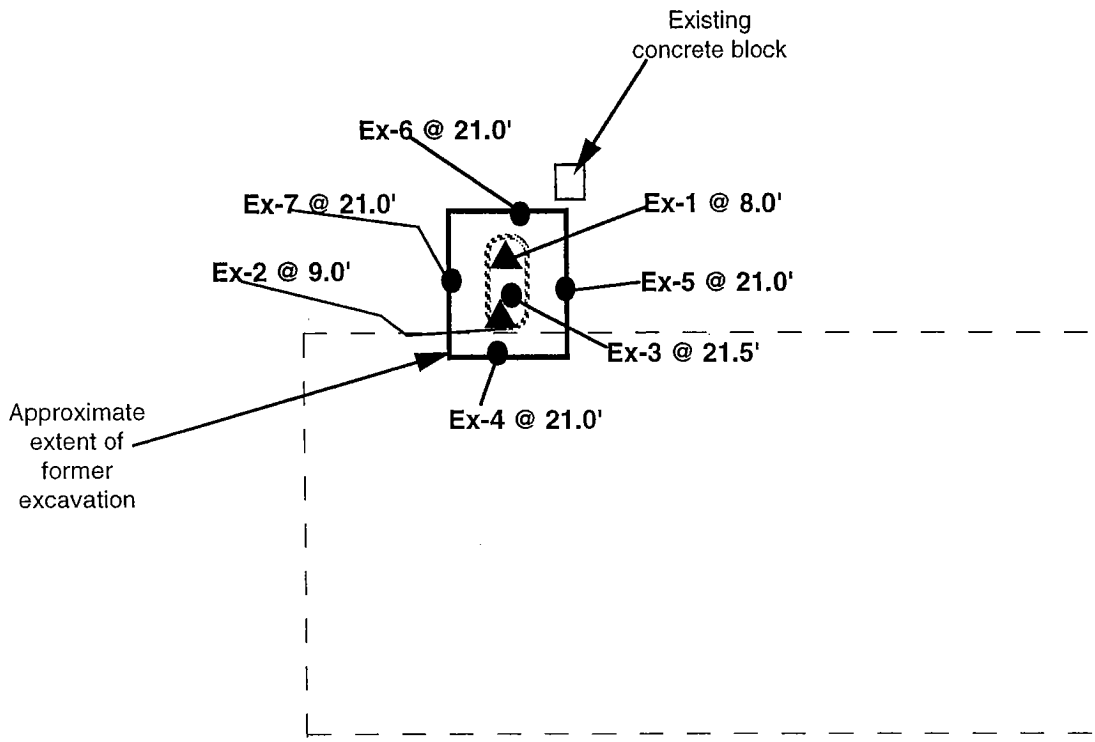
Job No.: 771

Appr.:

Date: 1/9/04

VICINITY MAP
COTATI STATION
8348 Santero Way
Cotati, California

PLATE
1



Construction Entrance

Santero Way

Legend

- Approximate location of former underground storage tank
- Ex-2 @ 9.0' — Approximate location of soil sample collected during underground storage tank removal on October 30, 2003. Sample depth is in feet below ground surface.
- Ex-7 @ 21.0' — Approximate location of soil sample collected during interim soil remediation on November 3, 2003. Sample depth is in feet below ground surface.
- Approximate location of apartment complex buliding pad.

NORTH

APPROXIMATE SCALE
(feet)

0 30 60

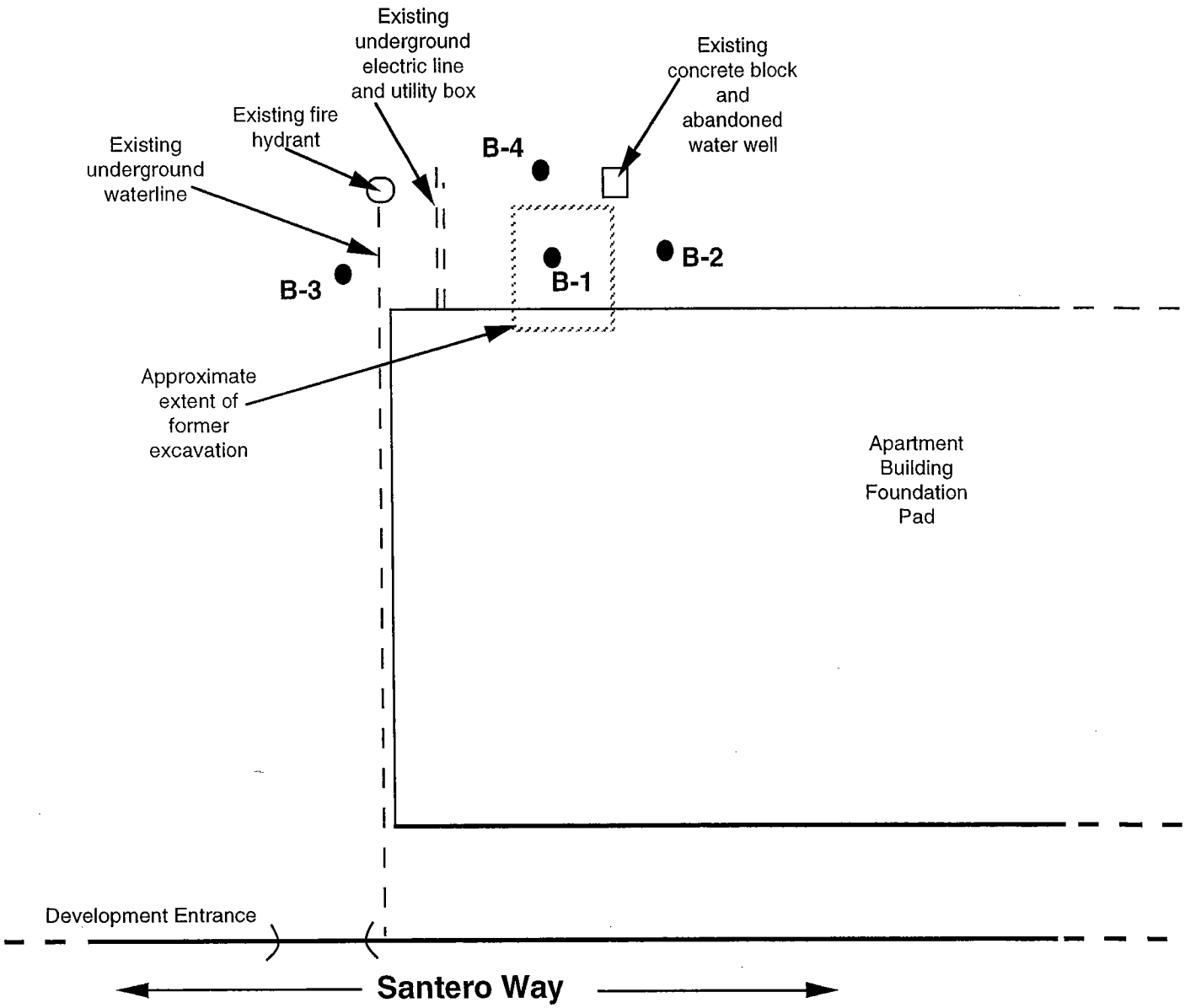
PROJECT NO.: 766		
DRAWN BY:	BC	6/18/03
CHECKED BY:		
APPROVED BY:	DMR	2/16/05

Brunsing Associates, Inc.

P.O. Box 588
Windsor, CA 95492
Phone 707-838-3027

PLATE 2

Excavation Soil Sample Location Map
Cotati Station
8348 Santero Way
Cotati, California



Legend

B-4 ● Approximate location of soil boring and number drilled on November 22, 2004.

NORTH

APPROXIMATE SCALE (feet)

0 30 60

PROJECT NO.: 766		
DRAWN BY:	BC	6/18/03
CHECKED BY:		
APPROVED BY:	DMA	2/16/05

Brunsing Associates, Inc.

P.O. Box 588
Windsor, CA 95492
Phone 707-838-3027

PLATE 3

Soil Boring Location Map
Cotati Station
8348 Santero Way
Cotati, California

BRUNSING ASSOCIATES, INC.
P.O. BOX 588
Windsor, CA. 95492
Telephone: (707) 838-3027
Fax: (707) 838-4420

BORING NO.: **B-1** SHEET 1 OF 1

PROJECT: **COTATI STATION**

LOCATION: **Cotati, California**

COORDINATES:

PROJECT NO.: **771**

SURFACE ELEVATION: DATUM:

LOGGED BY: **SMS**

SAMPLE INFORMATION						DESCRIPTION	STRATA	WELL CONSTRUCTION DETAIL
DEPTH FEET	LAB SAMPLE	SAMPLE TYPE	BLOW COUNTS	Recovery (%)	PID (ppm)			
5			12 11 11		0.0	DARK BROWN-BLACK CLAY (CL) dry to moist, stiff, ~5% gravel, ~95% clay, angular gravel up to ~22mm		5
10			5 5 8		0.0	BROWN CLAY (CL) moist, soft to medium stiff, ~5% coarse-grained sand, ~10% silt, ~85% clay		10
15			19 22 30		5.0	DARK BROWN-GREENISH BROWN SANDY GRAVEL (GC) moist, medium dense, ~40% gravel, ~30% very coarse to medium-grained sand, ~10% silt, ~20% clay, subrounded gravel up to ~14mm		15
20			8 11 11 6 7 7		0.0	GRAVEL (GP) wet, loose, ~90% gravel, ~10% silt, angular gravel up to 16mm (possible backfill material?)		▽ 20

DRILLING CONTRACTOR: Clear Heart

DRILLING METHOD: 6-inch hollow stem auger

DRILLING EQUIPMENT: Deeprock Dr10K

DRILLING STARTED: 11/22/04 ENDED: 11/22/04

REMARKS Boring drilled to 20.0' BGS.
Sampler driven to 23.0' BGS

See key sheet for symbols and abbreviations used above.

BRUNSING ASSOCIATES, INC.

Job No.: 771

Appr.:

Date: 2/10/05

LOG OF BORING B-1
COTATI STATION
8348 Santero Way
Cotati, California

PLATE 4

ENVIRONMENTAL BORING LOG AND WELL COMPLETION 20050210.GPJ BACE.GDT 2/10/05

BRUNSING ASSOCIATES, INC.
P.O. BOX 588
Windsor, CA. 95492
Telephone: (707) 838-3027
Fax: (707) 838-4420

BORING NO.: **B-2** SHEET 1 OF 1

PROJECT: **COTATI STATION**

LOCATION: **Cotati, California**

PROJECT NO.: **771**

COORDINATES:

SURFACE ELEVATION: DATUM:

LOGGED BY: **SMS**

SAMPLE INFORMATION						DESCRIPTION	STRATA	WELL CONSTRUCTION DETAIL
DEPTH FEET	LAB SAMPLE	SAMPLE TYPE	BLOW COUNTS	Recovery (%)	PID (ppm)			
5			6 9 18		0.0	DARK BROWN SILTY CLAY (CL) dry to moist, medium stiff to stiff, ~5% fine to very fine-grained sand, ~10% silt, ~85% clay		5
10			9 9 10		0.0	BROWN CLAY (CL) moist, medium stiff, trace medium-grained sand, ~15% silt, ~85% clay		10
15			17 19 31		5.0	BROWN CLAYEY SILTY SANDY GRAVEL (GC) dry to moist, medium dense, ~40% gravel, ~30% very coarse to very fine-grained sand, ~15% silt, ~15% clay, subangular gravel up to 32mm		15
20			7 9 11		10.0	BROWN SILTY CLAY (CL) moist to wet, medium stiff, trace subangular gravel up to 14mm, trace medium to fine-grained sand,~15% silt, ~85% clay		20

▽

DRILLING CONTRACTOR: Clear Heart

DRILLING METHOD: 6-inch hollow stem auger

DRILLING EQUIPMENT: Deeprock Dr10K

DRILLING STARTED: 11/22/04 ENDED: 11/22/04

REMARKS Boring drilled to 20.0' BGS.
Sampler driven to 21.5' BGS

See key sheet for symbols and abbreviations used above.

BRUNSING ASSOCIATES, INC.

Job No.: 771

Appr.:

Date: 2/10/05

LOG OF BORING B-2
COTATI STATION
8348 Santero Way
Cotati, California

PLATE 5

ENVIRONMENTAL BORING LOG AND WELL COMPLETION 20050210.GPJ BACE.GDT 2/10/05

BRUNSING ASSOCIATES, INC.
P.O. BOX 588
Windsor, CA. 95492
Telephone: (707) 838-3027
Fax: (707) 838-4420

BORING NO.: **B-3** SHEET 1 OF 1

PROJECT: **COTATI STATION**

LOCATION: **Cotati, California**

PROJECT NO.: **771**

COORDINATES:

SURFACE ELEVATION: DATUM:

LOGGED BY: **SMS**

SAMPLE INFORMATION						DESCRIPTION	STRATA	WELL CONSTRUCTION DETAIL
DEPTH FEET	LAB SAMPLE	SAMPLE TYPE	BLOW COUNTS	Recovery (%)	PID (ppm)			
5			6 8 14		5.0	DARK BROWN CLAY (CL) dry to moist, medium stiff to stiff, ~20% silt, ~80% clay, trace coarse-grained sand		5
10			15 12 12		5.0	BROWN CLAYEY GRAVELLY SILTY SAND (SM) moist, loose, ~20% gravel, ~50% very coarse to very fine-grained sand, ~20% silt, ~10% clay, subrounded gravel up to 22mm		10
15			24 33 29		10.0	BROWN CLAYEY SILTY SANDY GRAVEL (GC) wet, medium dense, ~70% gravel, ~10% very coarse to coarse-grained sand, ~10% silt, ~10% clay, angular gravel up to 36mm		15 ▽

DRILLING CONTRACTOR: Clear Heart

DRILLING METHOD: 6-inch hollow stem auger

DRILLING EQUIPMENT: Deeprock Dr10K

DRILLING STARTED: 11/22/04 ENDED: 11/22/04

REMARKS Boring drilled to 15.0' BGS.
Sampler driven to 16.5' BGS

See key sheet for symbols and abbreviations used above.

BRUNSING ASSOCIATES, INC.

Job No.: 771

Appr.:

Date: 2/16/05

LOG OF BORING B-3
COTATI STATION
8348 Santero Way
Cotati, California

PLATE 6

ENVIRONMENTAL BORING LOG AND WELL COMPLETION 20050210.GPJ BACE.GDT 2/16/05

BRUNSING ASSOCIATES, INC.
P.O. BOX 588
Windsor, CA. 95492
Telephone: (707) 838-3027
Fax: (707) 838-4420

BORING NO.: **B-4** SHEET 1 OF 1

PROJECT: **COTATI STATION**

LOCATION: **Cotati, California**

COORDINATES:

PROJECT NO.: **771**

SURFACE ELEVATION: DATUM:

LOGGED BY: **SMS**

SAMPLE INFORMATION						DESCRIPTION	STRATA	WELL CONSTRUCTION DETAIL
DEPTH FEET	LAB SAMPLE	SAMPLE TYPE	BLOW COUNTS	Recovery (%)	PID (ppm)			
5			8 14 17		5.0	DARK BROWN CLAY (CL) dry to moist, stiff, ~5% fine to very fine-grained sand, ~10% silt, ~85% clay		5
10			21 19 21		5.0	BROWN CLAY (CL) dry to moist, very stiff, ~10% fine to very fine-grained sand, ~15% silt, ~75% clay		10
15			9 14 23		5.0	BROWN CLAY (CL) dry to moist, stiff to very stiff, ~15% silt, ~85% clay		15
20			7 9 18		5.0	BROWN SILTY CLAY (CL) wet, medium stiff, trace gravel, trace very coarse-grained sand, ~20% silt, ~80% clay, subangular gravel up tp 8mm		20
25			12 18 25		5.0	BROWN SILTY CLAY (CL) moist to wet, ~10% medium to very fine-grained sand, ~30% silt, ~60% clay, trace coarse sand		25

▽

DRILLING CONTRACTOR: Clear heart

DRILLING METHOD: 6-inch hollow stem auger

DRILLING EQUIPMENT: Deeprock Dr10K

DRILLING STARTED: 11/22/04 ENDED: 11/22/04

REMARKS Boring drilled to 25.0' BGS.
Sampler driven to 26.5' BGS

See key sheet for symbols and abbreviations used above.

BRUNSING ASSOCIATES, INC.

Job No.: 771

Appr.:

Date: 2/16/05

LOG OF BORING B-4
COTATI STATION
8348 Santero Way
Cotati, California

PLATE 7

ENVIRONMENTAL BORING LOG AND WELL COMPLETION 20050210.GPJ BACE.GDT 2/16/05

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

RELATIVE CONSISTENCY CLASSIFICATION

GRANULAR	COHESIVE
Silts, Sands, and Gravels	Clays and Clayey Silts
VERY LOOSE	SOFT
LOOSE	MEDIUM STIFF
MEDIUM DENSE	STIFF
DENSE	VERY STIFF
VERY DENSE	HARD

Relative Moisture Contents
DRY
DAMP
MOIST
WET
SATURATED

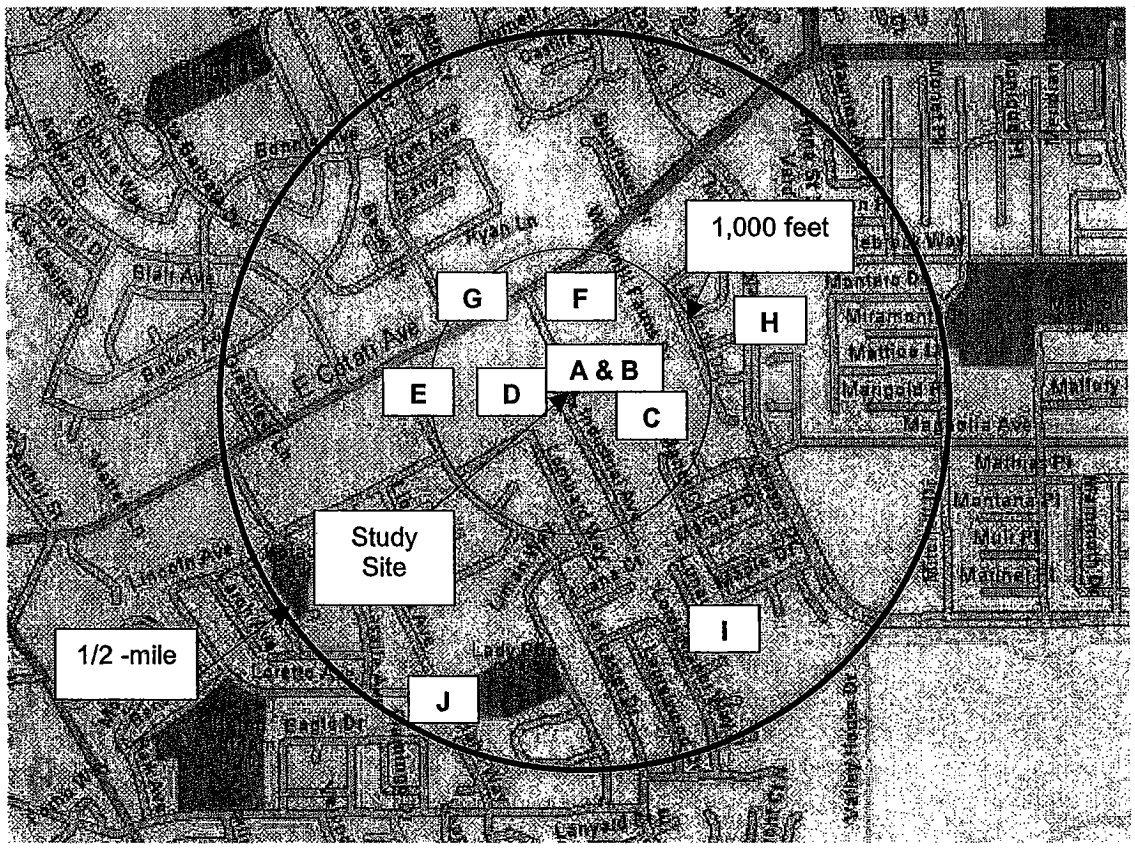
■ - Undisturbed sample retained ▨ - Recovered, not retained ⊠ - Bulk Sample ▽ - Depth to water

Brunsing Associates, Inc.
5803 Skylane Blvd., Suite A
Windsor, California 95492
Tel: (707) 838-3027

Job No.: 771
Appr.:
Date: 1/24/05

UNIFIED SOIL CLASSIFICATION CHART
COTATI STATION
8348 Santero Way
Cotati, California

PLATE
8



Notes:

J Approximate location of well

Wells A through G are domestic supply or irrigation wells.

Wells H, I, and J are municipal wells.

NORTH

APPROXIMATE SCALE
(feet)

0 1300 2600

Ref: MapQuest, dated 2004

PROJECT NO.: 771		
DRAWN BY:	BC	12/15/03
CHECKED BY:		
APPROVED BY:		

Brunsing Associates, Inc.
P.O. Box 588
Windsor, CA 95492
Phone 707-838-3027

PLATE 9
Domestic and Municipal Wells Location Map
Cotati Station
8348 Santero Way
Cotati, California